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Development and validation of the information literacy assessment in connectivism learning environment for undergraduate students

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Abstract

Connectivism is a new learning theory, which used for designing the world's first Massive Online Open Course (MOOC), and become accepted to be an alternative way to design information literacy (IL) course with information-rich environment. Though there are, few papers have reported the development and validation of a Connectivism assessment tool for undergraduate students. This paper aim to report on the development and validation of the information literacy assessment tools for undergraduate student. The assessment tools consisted of three instruments including (1) IL Test, (2) IL Rubric, and (3) Information Literacy Self-efficacy (ILSE) Scale. Three information literacy experts were selected to validate the content using item objective congruence, and five undergraduate students were selected to validate the face validity. Then thirty undergraduate students were selected to try out the instruments. The results suggested that the development of these tools be appropriate for undergraduate students.

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1. Introduction

From the researchers recent paper at the World conference on educational sciences which was held in Malta in 2014 (WCES 2014). We have proposed the cloud-based virtual classroom learning model, constructed from the basis

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of Connectivism theory. After the model had been proposed, the researchers were continuing to study on the information literacy assessment, to develop the suitable assessment tools.

1.1. Connectivism Learning Model

From the researchers proposed model at WCES 2014, the Connectivism learning model consisted of four steps that students have to proceed on the cloud-based virtual classroom as follows:

(1) Aggregation: In the first step, learners have to find the main topic to study from communication tools, and then list the topics and keywords to conduct searching strategies. After accessing to the information, learners have to store and organize information by using collaboration tools.

(2) Remixing: In the second step, learners have to transfer the prior knowledge to decide which information should be used in their work, then evaluate the quality of information by using data gathering tools, and sharing the information with friends by using collaboration tools.

(3) Repurposing: In the third step, learners have to use the content creation tools to read and summarize the relevant information. After gathering enough summary, learners have to analyze and synthesize the data to generate a new information by using content creation tools, and then evaluate their work and revise.

(4) Feed-forward: In the final step, learners have to publish their work by using presentation tools, and sharing their work with classmates to exchange the opinion, and then feed-forward their work to the social network by using communication tools to get feedback on their work. After the feed-forward process they have to reflect their thinking and feeling about the feedback, and plan to develop their ability in the next project.

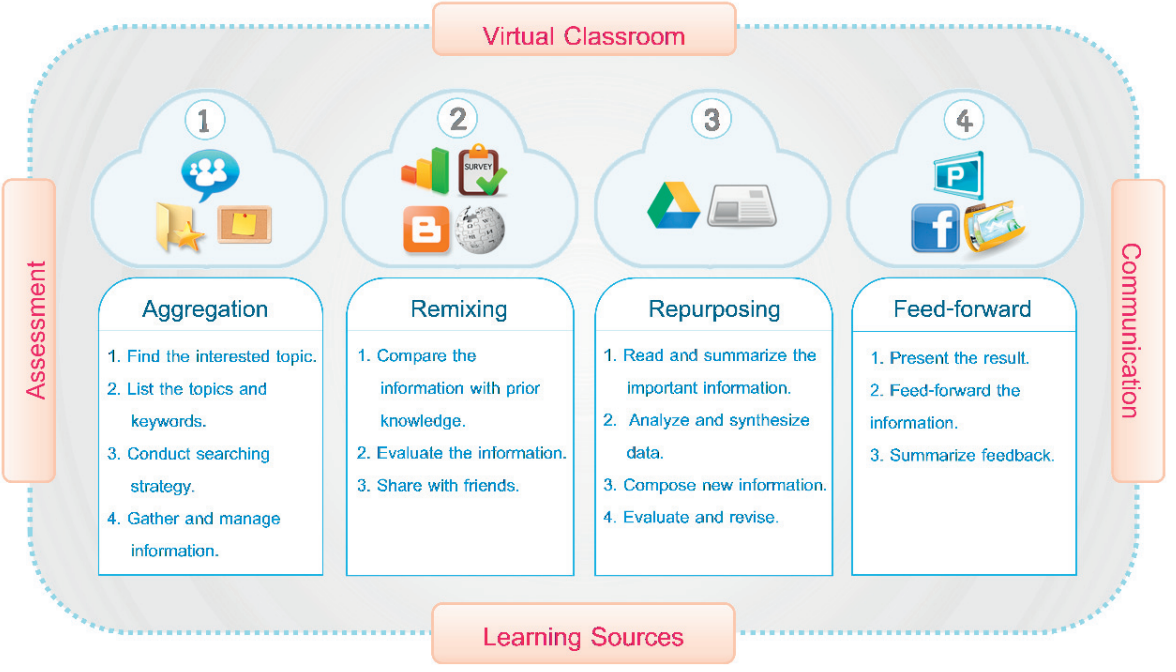

Fig. 1. A Proposed Model of Connectivism Learning Using Cloud-based Virtual Classroom

1.2. Assessment Framework

> *"Information Literacy is the ability to identify what information is needed, understand how the information is organized, identify the best sources of information for a given need, locate those sources, evaluate the sources critically, and share that information."* (University of Idaho, n.d.)

According to the definition of information literacy and the process of the learning model as the researchers mentioned above, the information literacy can be divided into two set of skills, were cognitive skills and psychomotor skills. From the study found that the focus of assessment in information literacy has been shifted from traditional assessment to the new dimension of assessment. The traditional assessment was focused on using the test or examination to assess the information literacy skill from the students, but the traditional assessment has some limitation. The tests can only assess the cognitive and knowledge skill, but cannot assess the psychomotor skills, which were an important domain of information literacy assessment too. So the information literacy rubrics has been proposed to eliminate the limitation of assessing students' psychomotor skills (Colorado State Department of Education, 1996). Moreover, the important factor that made students become successful in learning is the students' self-efficacy, Kurbanoglu, Akkoyunlu and Umay (2006) have proposed the new dimension of information literacy assessment by using the information literacy self-efficacy scale (ILSE) along with the traditional assessment. From this perspective, the recent trend of information literacy assessment is often measured students' information literacy more than one dimension. So the researchers conducted the information literacy assessment framework into 3 dimension as follows: (1) Knowledge and Cognitive Dimension, (2) Performance and Practice Dimension and (3) Self and Attitude Dimension.

1.3. Assessment Tools

According to the information literacy framework, the researchers have selected suitable tools to assess the information literacy of students in three dimensions as see on the table 1.

Table 1. Dimensions of assessment and tools.

Dimensions	Tools
Knowledge and Cognitive Dimension Assessment	Information Literacy Test
Performance and Practice Dimension Assessment	Information Literacy Rubrics
Self and Attitude Dimension Assessment	Information Literacy Self-efficacy Scale

From the table 1, the first dimension is knowledge and cognitive dimension assessment, a representative of traditional information literacy assessment dimension. The multiple choices information literacy test was chosen to assess this dimension. The second dimension is performance and practice dimension assessment, a representative of psychomotor dimension assessment. The information literacy rubrics was chosen to assess this dimension. So the last one is self and attitude dimension assessment the representative of affective dimension assessment. The information literacy self-efficacy scale was chosen to assess this dimension.

2. Methodology

The main purpose of this study is to describe the development and validation of three information literacy tools designed to measure three dimensions of information literacy from the students and find out how well the instrument can assess. The researchers have tryout these tools with 30 undergraduate students from the Faculty of Education, Chulalongkorn University. The development and validation of these tools divided into 3 phases as follows:

2.1. Phase 1: Construct the assessment structures

In the first phase, the researchers have reviewed all of the related documents to construct the assessment structure of these tools. The structure of information literacy tests was constructed from the literature reviewed, and four main categories, (1) Accessing Information, (2) Managing Information, (3) Evaluating Information and (4) Creating Information, were named, and to covering each category 45-multiple choices test items were developed. The structure of information literacy rubrics was constructed follow the learning activities in Connectivism learning model, three scale rubrics, anchored with notations: Good, Fair and Poor, was used to construct the information literacy rubrics. Moreover, the ILSE scale was modified from Kurbanoglu, Akkoyunlu and Umay (2006) ILSE scale

by using the symmetric translation method into Thai language, then re-categorize the seven categories into the researchers' four main categories.

2.2. Phase 2: Validate the Tools

In this phase, the nine-information literacy experts were selected to validate the assessment tools by using item objective congruence (three experts for each tool), and then validate the face validity of these tools by gathering the data from five undergraduate students.

2.3. Phase 3: Tryout the Tools

In the third phase, the researchers have tryout the assessment tools with 30 undergraduate students from the Faculty of Education, Chulalongkorn University. Then analyze the reliability using Kuder-Richardson method for the IL Test, and using Cronbach's alpha for the ILSE test. Except the IL rubrics were tryout by selected two instructors to bring the IL rubrics to use with the sample of student works, and then calculated the correlation of the scores between two instructors.

3. Results

3.1. The Result from Development and Validation of IL Tests

The multiple choices IL test have 45 questions in four categories (Access, Manage, Evaluate and Create Information). After the experts validate the test items, there were 30-test items covering each category have IOC scores more than 0.67 and also have the face validity from the students more than 0.67 every item too. The result from the tryout was analyzed by using Kuder-Richardson method indicated that the P-Value (Difficulty) of every test items are between 0.2 to 0.8, and R-Value (Discrimination) of every test items are more than 0.6. This mean the IL test can be used to assess the information literacy in Knowledge and Cognitive Dimension.

3.2. The Result from Development and Validation of IL Rubrics

The IL rubrics have three-scoring scales (Good, Fair and Poor), every item in IL rubrics have IOC scores more than 0.67 from the experts validation and also have the face validity from the students more than 0.67 every item too. The correlation between the scores from 2 instructors was greater than 0.7, so this IL rubrics can be used to assess the information literacy in Performance and Practice Dimension.

3.3. The Result from Development and Validation of ILSE scale

The modified Kurbanoglu's seven-point ILSE scale have 28 items in four categories (Access, Manage, Evaluate and Create Information). Every item in ILSE scale have IOC scores more than 0.67 from the experts validation and also have the face validity from the students more than 0.67 every item too. The Cronbach's alpha of ILSE scale equals 0.97, so this mean the IL test can be used to assess the information literacy in Self and Attitude Dimension.

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